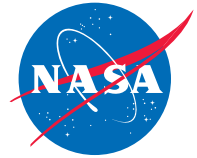




Measurements to Assess Climate Change



Highlights

- ▶ Data gathered from EOS will advance scientists' understanding of the Earth as a system.
- ▶ The data will help discriminate between human-induced and natural changes in the Earth's system.
- ▶ EOS will provide continuous observations for a minimum of 15 years.

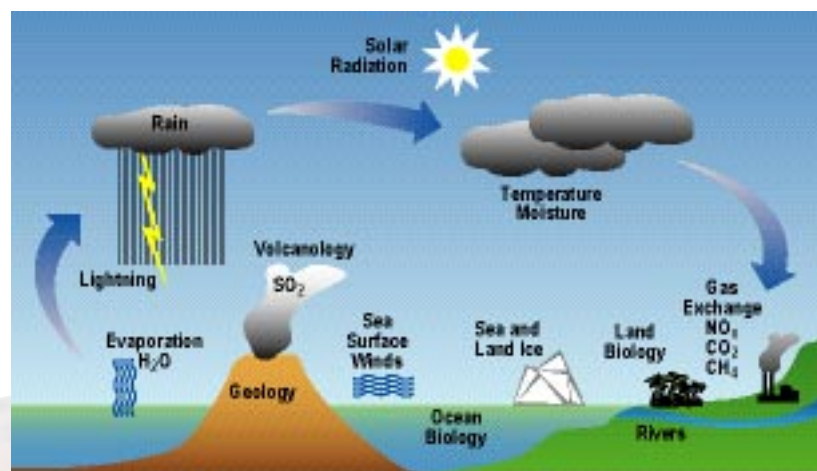
Scientific discoveries and media attention have made issues such as global warming, ozone depletion, water quality, and land-use change common concerns for all. Possible serious repercussions from predicted global warming include increased temperatures, rising sea levels, changing patterns of precipitation, increased evaporation, and an increase in the number of extreme weather events (i.e., drought, floods, and hurricanes).

Current scientific studies of global change, based on existing data sets and models, have shown that human activities have an enormous influence on the climatic and biological conditions of the Earth's system. Unfortunately, given the critical observational limitations researchers now face, even the most comprehensive models produce results with large uncertainties.

For some time, scientists have needed long-term, consistent measurements of key physical parameters (such as sea surface temperature, atmospheric temperature profiles, etc.) that define shifts in the state and variability of Earth system components. Without these measurements, predictions of the complex responses of the Earth's system to human activities and natural variations do not have an adequate basis for developing and validating global predictive models, or for establishing a baseline to determine trends.

Space-based observations hold the key to making progress because satellites are capable of capturing a consistent, synoptic global perspective.

NASA's Earth Observing System (EOS) will observe the key physical variables needed to advance understanding of the entire Earth system and to develop a deeper comprehension of the interactions among its components. By enhancing understanding of the processes involved, EOS can help discriminate between human-induced and natural changes. Measurements of the atmosphere, land, oceans, cryosphere, and solar driving force are the highest priority elements for representing each of the Earth system components. EOS is capable of measuring each of these elements. To quantify changes in the Earth system, EOS will provide systematic, continuous observations from low-Earth orbit for a minimum of 15 years.



Earth System Process Schematic